Abstracts

These selected abstracts and titles from the world literature are arranged in the following sections:

Syphilis and other treponematoses (clinical and therapy)

Diagnosis of syphilis
H-J HAGEDORN (University of Dusseldorf, W Germany). *Dtsch Med Wochenschr* 1981;**106**:842.

Syphilis (pathology and experimental)

Cultivation of virulent *Treponema pallidum* in tissue culture
AH FIELDSTEEL, DL COX, AND RA MOECKLI (SRI International, Menlo Park, California, USA). *Infect Immun* 1981; **32**:908-15.

This paper is a milestone in venereological research as it describes clearly with considerable detail the in-vitro culture of *Treponema pallidum*. A cottontail rabbit epithelium cell line was grown in a basal medium (the formula for which is given) and inoculated with three different quantities of *T pallidum* (Nichols strain), 10^6, $2{\cdot}5 \times 10^6$, and 10^7 treponemes. The cell culture was maintained in an environment of 1·5% O_2, 5% CO_2, and 93·5% N_2. After five days the number of organisms had increased to between 8×10^6 and $2{\cdot}59 \times 10^7$, growth continuing over the next 4-7 days to reach a plateau of about 10^8 organisms. The increase in numbers was measured by direct counts of the organisms and by estimating the increase in treponemal DNA; this was greatest when the inoculum was 10^6 organisms. The amount of DNA per treponeme in each of the inoculum groups was consistent ($3{\cdot}14 \pm 0{\cdot}72 \times 10^{-14}$g per treponeme). Virulence was tested after seven days' incubation by inoculating the shaved back of rabbits. In every case a lesion containing treponemes was produced.

Scanning electron microscopy of the cell culture showed the formation of micro-colonies on the surface of the epithelial cells.

One important feature of these experiments was that they were repeated in a different laboratory and were shown to be reproducible.

G D Morrison

Helical conformation of *T pallidum* (Nichols strain), *T paraluis-cuniculi, T denticola, B turicatae,* and unidentified oral spirochetes
DE STEPAN AND RC JOHNSON (University of Minnesota, Minneapolis, USA). *Infect Immun* 1981;**32**:937-40.

The authors used scanning electron microscopy to investigate whether treponemes are flat-wave forms or helices. *T pallidum* was found to exist in both forms, the majority (75%) being a left-handed helix. *T paraluis-cuniculi* existed exclusively as a left-handed helix. *Borrelia turicatae* was found to have a right-handed helix along with *T denticola*. The electron photomicrography is of very good quality in this paper.

G D Morrison

Gonorrhoea (clinical)

Diagnosis of gonorrhoea
H-J HEITE (Waldkirch, W Germany). *Dtsch Med Wochenschr* 1981;**106**:872.

Ocular gonococcal infection with little or no inflammatory response
JK PODGORE AND KK HOLMES (Madigan Army Medical Centre, Tacoma, Washington, USA). *JAMA* 1981;**246**:242.

Gonorrhoea (microbiology)

Molecular and phenotypic characterization of penicillinase-producing *Neisseria gonorrhoeae* from Canadian sources
JAR DILLON, P DUCK, AND DY THOMAS (Toronto, Canada). *Antimicrob Agents Chemother* 1981;**19**:952-7.

Pathogenic mechanisms of *Neisseria gonorrhoeae:* observations on damage to human fallopian tubes in organ culture by gonococci of colony type 1 or type 4
Z McGEE, AP JOHNSON, AND D TAYLOR-ROBINSON (Vanderbilt University School of Medicine, Nashville, Tennessee, USA). *J Infect Dis* 1981;**143**:413-22.

Studies of toxicity of *N gonorrhoeae* for human fallopian tube mucosa
MA MELLY, CR GREGG, AND ZA McGEE (Vanderbilt University School of Medicine, Nashville, Tennessee, USA). *J Infect Dis* 1981;**143**:423-31.

Toxic activity of purified lipopolysaccharide of *N gonorrhoeae* for human fallopian tube mucosa
CR GREGG, MA MELLY, GG HELLERQVIST, *et al* (Vanderbilt University School of Medicine, Nashville, Tennessee, USA). *J Infect Dis* 1981;**143**:432-9.

Monoclonal antibodies against *Neisseria gonorrhoeae:* production of antibodies directed against a strain-specific cell-surface antigen
I NACHAMKIN, JG CANNON, AND RS MITTLER (Department of Clinical Pathology, Virginia University, Richmond, Virginia, USA). *Infect Immun* 1981; **32:** 641-8.

Identification and isolation of novel pilus types produced by variants of *N gonorrhoeae* P9 following selection in vivo
PR LAMBDEN, JE HECKELS, H McBRIDE, AND PJ WATT (University of Southampton, Southampton, UK). *FEMS Microbiol Letters* 1981; **10:** 339-42.

Antigen-specific serotyping of *N gonorrhoeae:* characterisation based upon principal outer membrane protein
TM BUCHANAN AND JF HILDEBRANDT (United States Public Health Service Hospital, Seattle, Washington, USA). *Infect Immun* 1981; **32:** 985-94.

Typing of gonococci has been attempted by many different means but none has proved sufficiently simple to find universal application. The system described is of considerable interest because it explores the distribution of an important constituent of the outer membrane of the gonococcus and, once reagents have been produced, allows commendably quick typing of gonococcal isolates.

An ELISA technique was used to detect differences in the principal outer membrane protein (protein 1) of the gonococcus. It involved extraction and purification of the protein by cell disruption and ultracentrifugation with or without chromatography using Sepharose 6B (which has an exclusion limit of 4×10^6 molecular weight). Fractions contaminated with less than 4% lipopolysaccharide were coated on to polystyrene tubes and used in an ELISA test both directly to detect antibody and indirectly to measure and identify protein 1 on the surface of gonococci in inhibition assays.

No differences in concentration of protein 1 were detected in different Kellogg colonial types or in opacity variants of the same strain.

Nine serotypes of protein 1 were identified (types 1-9). An initial table indicates that only types 1 and 2 showed any significant antigenic sharing (about 30%), the other types showing little cross-reaction.

When the system was used to type 125 strains of gonococci, 124 could be typed. Of these, 35% typed with a single protein 1 serotype; the others reacted with more than one. The reasons for this multiple reactivity are discussed at length but the system as it stood showed considerable selectivity; there appeared to be a correlation between the clinical syndrome produced by a gonococcus and its protein 1 type.

A E Jephcott

Isolation and characterisation of a β-lactamase-specifying plasmid in a strain of *N gonorrhoeae*
JC LEFEVRE, MF PRERE, AND F BOUVIER (Faculty of Medicine, Toulouse University, Toulouse, France). *Ann Microbiol* 1981; **A132:** 283-92.

Effects of proteolytic enzymes on the outer membrane proteins of *N gonorrhoeae*
MS BLAKE, EC GOTSCHLICH, AND J SWANSON (Rockefeller University, New York, USA). *Infect Immun* 1981; **33:** 212-22.

Gonorrhoea (therapy)

Treatment of gonorrhoea
H-J HEITE (Waldkirch, West Germany). *Dtsch Med Wochenschr* 1981; **106:** 873.

Non-specific genital infection

Microtest procedure for isolation of *Chlamydia trachomatis*
BL YODER, WE STAMM, CM KOESTER, AND ER ALEXANDER (University of Washington, Seattle, USA). *J Clin Microbiol* 1981; **13:** 1036-9.

Mycoplasmas in male genital tract infections
T KUMAR, B KUMAR, PJ ASNANI, *et al* (Punjab University, Chandigarh, India). *Indian J Med Res* 1981; **73:** 715-9.

Prevalence of *Chlamydia trachomatis* and *N gonorrhoeae* in two different populations of women
WR BOWIE, CJ BORRIE-HULME, LM MANZON, *et al* (University of British Columbia, Vancouver, BC, Canada). *Can Med Assoc J* 1981; **124:** 1477.

***Chlamydia trachomatis* infection in mothers and infants—a prospective study**
AD HEGGIE, GG LUMICAE, LA STUART, AND MT GYVES (University Hospital, Cleveland, Ohio, USA). *Am J Dis Child* 1981; **135:** 507-11.

Diagnosis of infectious non-gonorrhoic urethritis
W BREDT (University of Freiburg, W Germany). *Dtsch Med Wochenschr* 1981; **106:** 909-10.

A newly discovered mycoplasma in the human urogenital tract
JG TULLY, D TAYLOR-ROBINSON, RM COLE, AND DL ROSE (National Institute of Health, Bethesda, Maryland, USA). *Lancet* 1981; i: 1288-91.

A new mycoplasma, serologically distinct from all other known mycoplasmas, was isolated from urethral specimens from two of 13 men with non-gonococcal urethritis. Repeatable isolation and propagation was accomplished by use of a special culture medium. The organisms adhered to glass or plastic, erythrocytes, and monkey kidney cells. This property appears to be associated with surface material restricted to the area of a terminal structure of the flask-shaped mycoplasmas. Although data are insufficient to implicate the new mycoplasmas in human disease, the fact that they are unique, extremely fastidious, and have adherence properties has stimulated efforts to assess their pathogenicity and possible role in human urogenital disease.

Authors' summary

Polypeptide composition of *Chlamydia trachomatis*
SH SALARI AND ME WARD (University of Southampton, Southampton, UK). *J Gen Microbiol* 1981; **123:** 197-209.

Experimental vaccination of monkeys and man with *Chlamydia trachomatis* suggests that immunity to ocular infection is type specific. Unfortunately, evidence also suggests that vaccinated subjects who subsequently become infected with chlamydia of heterologous serotype develop more severe ocular disease than unvaccinated controls, presumably as a result of hypersensitivity reactions to chlamydial group-specific antigens. Characterisation of chlamydial antigens is thus essential to an understanding of the pathogenesis of

chlamydial ocular and genital tract infections and the development of a vaccine. Unfortunately, the chlamydia responsible for trachoma in the third world and for genital tract infections in developed countries are difficult to grow and purify in adequate quantity for immunochemical analysis. The methods used to grow and purify *C trachomatis* strains for such studies and the polypeptide composition of strains representative of 14 of the 15 chlamydial serotypes are described in this paper.

It has been known for some time that the susceptibility of HeLa 229 cells to infection with most *C trachomatis* serotypes is increased if the cells are first washed in DEAE-dextran before chlamydial challenge. In this study the optimal concentration of DEAE-dextran required to maximise chlamydial yields was determined for each serotype. After homogenisation to release the chlamydia from within the infected HeLa cells the former were separated from host-cell material by centrifugation on a metrizoate density gradient, exploiting the fact that chlamydia and host-cell material have different buoyant density in aqueous media. The purity of the separated chlamydia was rigorously confirmed by several different criteria. The purified chlamydia were solubilised in detergent and the liberated polypeptides characterised by electrophoresis in the presence of detergent on a molecular-size-limiting gradient of polyacrylamide. Not surprisingly, chlamydia possessed a large number of unique polypeptides, many of which were present in all 14 serotypes examined. The most dominant polypeptide, however, which the authors believe represents the major chlamydial surface protein, varied in its molecular weight from 38 000-42 000 daltons according to serotype. Interestingly, chlamydial serotypes responsible for either trachoma, non-specific genital tract infection (NSGI), or lymphogranuloma venereum (LGV) each had their own characteristic major polypeptide. Thus, it was postulated that the major chlamydial polypeptide might be of evolutionary or pathological importance. In addition, LGV agents possessed a unique polypeptide of 118 000 daltons not found among the strains of chlamydia causing trachoma or uncomplicated genital infection (NSGI).

The chlamydial surface must be an important target for host immune defences as well as being vital in the attachment and penetration of chlamydia into host cells. Using a technique which selectively labels only proteins present at the microbial surface it was suggested that the major chlamydial polypeptide and polypeptides of 29 000 and 155 000 daltons (molecular weight) were located at the chlamydial surface. Comparison with other work suggests the chlamydial 29 000-dalton polypeptide is type specific (possibly responsible for type-specific immunity) and the 155 000-dalton polypeptide is species specific.

M E Ward

Studies on *Chlamydia trachomatis* as a cause of lower urogenital tract infection

G JOHANNISSON (University of Göteborg, Göteborg, Sweden). *Acta Dermato-venereol* 1981;**93** suppl.

This study (which is based on other publications by the author and his colleagues) examines the local prevalence, natural history, infectivity, and susceptibility to antibiotics in vitro and in vivo of infections of the lower genital tract with *C trachomatis.*

In men with non-gonococcal urethritis attending the venereal diseases clinic in Göteborg, 43% and 44% (two studies) were infected with *C trachomatis* as were 73% of men with post-gonococcal urethritis. Five per cent of men without urethritis were also isolation-positive, as were 38% and 27% of women in two further studies. Fifteen per cent of women were found to be infected in the urethra alone. The prevalence in men with NGU attending a urology clinic was 26%, of whom 26/96 also had chlamydia in their prostatic fluid. The incubation period of chlamydial urethritis was one week or less in 43% of men, but women were often asymptomatic. Infections in both sexes were found to be self-limiting in a small series of patients left untreated, and the infectivity of *C trachomatis* was less than that of *Neisseria gonorrhoeae.*

In-vitro studies with 13 antibiotics to four strains of *C trachomatis* showed that erythromycin, pivampicillin, oxytetracycline, and doxycycline were the most effective; the latter was considered to be the best treatment for NGU in men when given for one week, although it was thought that more prolonged therapy should be given to women.

The supplement includes an introduction into the history, classification, isolation, and serology of *C trachomatis;* details of specimen collection and laboratory methods are clearly defined. A general discussion provides a concise summary of the many aspects of chlamydial infections and, with 145 references, this publication will be of value to all those with an interest in this field.

J R Willcox

Non-gonococcal urethritis—epidemiological and etiological study in Italy

R CEVENINI, C VAROTTI, F RUMPIANESI, *et al* (Ospedale S Orsola, Institute of Microbiology, Bologna, Italy). *Boll Inst Sieroter (Milan)* 1980;**59**:599-604.

One-week treatment of chlamydia-positive urethritis with doxycycline and tetracycline chloride in males

T JUVAKOSKI, J LAUHARANTA, L KANERVA, AND A LASSUS (Department of Dermatology, University of Helsinki, Finland). *Acta Dermatovenereol* 1981;**61**:273.

Effect of cycloheximide in the infective yield of a genital strain of *Chlamydia trachomatis* in McCoy cells

P KARAYIANNIS, D HOBSON, AND N LEE (Department of Medical Microbiology, University of Liverpool, Liverpool, UK). *Infect Immun* 1981;**33**:309-31.

Reiter's disease

Reiter's syndrome—evaluation of preliminary criteria for definite disease

RF WILLKENS, FC ARNETT, T BITTER, *et al* (University of Washington, Seattle, USA). *Arthritis Rheum* 1981;**24**:844-9.

A retrospective attempt to define 'definite' Reiter's syndrome (RS) was made by evaluating 66 clinical features in 83 patients with typical RS and comparing them with a control group (53 with ankylosing spondylitis, 33 with seronegative rheumatoid arthritis, 53 with psoriatic arthritis, and 27 with gonococcal arthritis).

From the data collected the proposal was made that 'Reiter's syndrome consists of an episode of peripheral arthritis of more than one month's duration occurring in association with urethritis and/or cervicitis'. The percentage of cases of RS satisfying these criteria (that is, sensitivity) was 84·3% at the initial episode and 97·6% when subsequent attacks were included. Specificity (percentage of control patients not satisfying the criteria) varied from 96·2% to 100%.

The authors compare the value of their proposals with those used in the diagnosis of rheumatoid arthritis and systemic lupus erythematosus, emphasising the inherent difficulties in RS due to the transient nature of the disease in some and the problem of long-term follow up.

Unfortunately, the definition of urethritis in this study is vague and there are no diagnostic criteria given for 'cervicitis,' although seven of 83 patients with RS were female.

R S Pattman

Trichomoniasis

A double-blind study of the value of treatment with a single dose of tinidazole of partners to females with trichomoniasis
J LYNG AND J CHRISTENSEN (Copenhagen, Denmark). *Acta Obstet Gynecol Scand* 1981;**60**:199-202.

Candidosis

Prevalence of yeasts and fungi other than *Candida albicans* in the vagina of normal young women
MJ GOLDACRE, LJR MILNE, B WATT, N LOUDON, AND MP VESSEY (Universities of Oxford and Edinburgh, UK). *Br J Obstet Gynaecol* 1981;**88**:596-600.

Genital herpes

Regular review: recurrent herpes simplex: the outlook for systemic antiviral agents
HJ FIELD AND D WILDY (University of Cambridge, UK). *Br Med J* 1981;**282**:1821-22.

Growth of herpes simplex virus types 1 and 2 in tissues of fertile hens eggs in ovo and in vitro
FD RODGERS (Public Health Laboratory, University of Nottingham, UK). *Br J Exp Pathol* 1981;**62**:317-22.

Herpesvirus-induced antigens in squamous-cell carcinoma in situ of the vulva
RH KAUFMAN, GR DREESMAN, J BUREK, OM KORHONEN, DO MATSON, *et al* (Baylor College of Medicine, Houston, Texas, USA). *N Engl J Med* 1981;**305**:483-8.

Squamous cell carcinoma in situ of the vulva appears to be increasing, even in women under 40 years. An HSV-2-specific DNA-binding protein was detected in biopsy specimens from nine out of 10 patients with this condition. In one of these patients there was severe dysplasia, and in another vulval carcinoma in situ.

In the controls, who included patients with condylomata acuminata and those attending for routine examinations, the findings were negative. In one patient the vulval changes developed six weeks after a primary HSV-2 infection of the vulva and in another after many years.

The results of this series must be considered speculative, but they should alert the physician to the possibility that carcinoma of the female genital tract may be induced by HSV-2 infection. Further large-scale investigations are needed.

G W Csonka

Other sexually transmitted diseases

Hepatitis A in homosexuals
A MINDEL AND R TEDDER (Academic Department of Genitourinary Medicine, Middlesex Hospital Medical School, London, UK). *Br Med J* 1981;**282**:1666.

Miscellaneous

Prevalence of bacteria in the vagina of normal young women
B WATT, MJ GOLDACRE, N LOUDON, DJ ANNAT, RI HARRIS, AND MP VESSEY (University of Edinburgh and Oxford, UK). *Br J Obstet Gynaecol* 1981;**88**:588-95.

In a study of factors related to the prevalence of bacteria in the vagina of 1498 women attending a family planning clinic, anaerobes were significantly commoner in women with an abnormal vaginal discharge on clinical examination, in those with a history of a troublesome vaginal discharge, and in those who used an intrauterine contraceptive device (IUCD). The association between anaerobes and abnormalities of vaginal discharge was found both in women who used the IUCD and in women who did not.

No significant associations between symptoms and other bacterial species or combinations of species were evident. Coliforms were significantly commoner in women who did not use tampons, in those who used the contraceptive diaphragm, and in those who had received recent antibacterial or antifungal treatment. Lactobacilli were significantly commoner in women who used the contraceptive pill and significantly less common in those who harboured *Candida albicans*, anaerobes, coliforms, or enterococci and in those who had been treated with antibacterial drugs. No important associations were found between the presence of bacteria and the patient's age, parity, or social class.

Authors' summary

Association of Behcet's disease with HLA-B5 in the Mexican Mestizo population
C LAVALLE, ALARCON-SEGOVIA, DEL GUIDICE-KNIPPING, AND FRAGA (Mexico City, Mexico). *J Rheumatol* 1981;**8**:325-8.

Treatment of *Haemophilus vaginalis* vaginitis
M MALOUF, M FORTIER, G MORIN, AND J-L DUBE (Quebec, Canada). *Obstet Gynecol* 1981;**57**:711-4.